AKIRA

makes life better

Air Conditional Service Manual

Model:
AC-FR50HK

CONTENTS

SPECIFICATIONS 4

FUNCTION DETAILS 6

EXPLODED VIEW & PART LIST 14

REFRIGERATION DIAGRAM 18

WIRING DIAGRAM 19

SPECIFICATION

Model No.			**AC-FR50HK**
Type			Floor standing (Heating Pump)
Cooling Capacity (Btu/h)			41000
Heating Capacity (Btu/h)			45000
Rated Input (w)	Cooling		4480
	Heating		4410
PTC Heater Power (W)			2500
Moisture Removal (L/H.r)			5.0
Air Circulation (CMH Max)			1700
EER for Cooling (Btu/h.w)			9.2
COP for Heating (w/w)			3.0
Volt/Phase/Hz			380V/3P/50Hz
Rated Current (A)	Cooling		9.7
	Heating		9.6
	PTC Heater		8.0
LRA (A)			55
Noise Level (dB (A))	Indoor Unit	High	54
		Low	44
	Outdoor Unit		64
System			
Refrigerant (g)			R22
Compressor type			Scroll
Compressor Model No.			C-SB353H8A
Compressor MFG			Sanyo
Expansion Device			Capillary
Evaporator			Copper and Aluminum Fin
Condenser			Copper and Aluminum Fin
Features			
LCD Wireless Remote Controller			No
LCD Display			Yes
Washable Filter			Yes
24 Hours Timer			Yes
3 Speed Control			Yes
Vertical Auto Swing Louver			Yes
Horizontal Auto Swing Louver			No

Model No.		**AC-FR50HK**
Sleep Operation		No
Smart Function		Yes
Jet Function		Yes
Electronic Lock		Yes
Auto Restart		Yes
PTC Heater		Yes
Other		
Dimensions WxHxD (mm)	Indoor Unit	540x1765x375
	Outdoor Unit	890x793x414
Net Weight (Kg)	Indoor Unit	55
	Outdoor Unit	93
Packing Dimensions WxHxD (mm)	Indoor Unit	660x1890x380
	Outdoor Unit	1050x910x500
Gross Weight (Kg)	Indoor Unit	70
	Outdoor Unit	105
Loading Capacity (40'/40' HC)		48/54
Approvals		CCEE

FUNCTION DETAILS

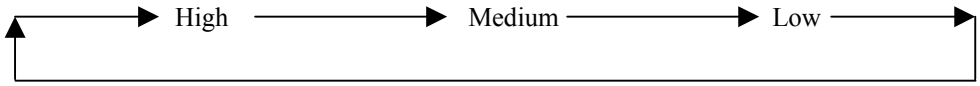
Button Introducing

1. ON/OFF button

Pressing this button at waiting orders to operate unit according to last operating mode. Pressing it for the first time after power supply, unit will operate in AUTO mode. Pressing it during operation, all loads stop, compressor turns into 3 minutes protection, LCD displays room temperature.

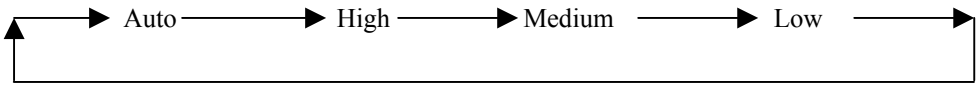
2. FAN button

Indoor fan motor operates according to the following circle while pressing the button in FAN mode.



FAN button is ineffective in DRY mode.

Indoor fan motor operates according to the following circle while pressing the button in other modes.



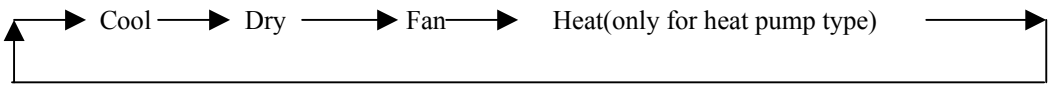
3. SWING/LOCK button

Press once to turn on or off swing motor. Press this button for 5 seconds and buzzer sounds once, the key set is locked and not manipulative, operation with remote controller is ineffective. Lock is unchained only pressing Swing/Lock button for 5 seconds and buzzer sounds once.

Note: LOCK function only for E-type floor standing

4. MODE button

A/C operates according to the following circle while pressing this button :



5. TEMPERATURE RISE button

Pressing this button once in cooling & heating mode, setting temperature is risen 1℃ till 32℃. Pressing this button once in smart & dry modes, setting temperature is risen 1℃, but the maximum rise is 2℃. This button is ineffective in other modes.

6. TEMPERATURE DROP button

Pressing this button once in cooling & heating mode, setting temperature is dropped 1℃ till 18℃. Pressing this button once in smart & dry modes, setting temperature is dropped 1℃ , but the maximum drop is 2℃. This button is ineffective in other modes.

7. TIMER button

Pressing this button for the first time, ——h is displayed and the TIMER symbol is flashed on the LCD. Pressing the button once to increase the preset time 0.5 hour (with 10 hours) or 1 hour(over 10 hours). Timing range is from 0.5 hour to 24 hours. Press TIMER function until ——h is displayed, timing is cancelled. Indicative symbol lights or extinguishes after stopping pressing button for 5 seconds, affirming setting time to start timer or cancel it.

8. SMART button

Press the SMART button, the unit enters smart mode (fuzzy logic operation) directly regardless of the unit is on or off. In this mode, temperature and fan speed are automatically set based on the actual room temperature. Operation mode and temperature are determined by indoor temperature according to the following table:

Heat pump models

Indoor temperature	Operation mode	Target temperature
21℃ or below	HEATING	22℃
21℃ -26℃	DRY	Room temperature decrease 1.5℃ after operate for 3 minutes
Over 26℃	COOLING	26℃

Cooling only models

Indoor temperature	Operation mode	Target temperature
26℃ or below	DRY	Room temperature decrease 1.5℃ after operate for 3 minutes
Over 26℃	COOLING	26℃

SMART button is ineffective in SUPER mode. Temperature and airflow are controlled automatically in SMART mode. However, a decrease or rise of up to 2 ℃ can be set with the remote controller according to the following table if you still feel uncomfortable.

A decrease or increase up to 2℃ can be set in SMART mode		
Your feeling	**button**	**adjustment procedure**
Slightly warmer A decrease up to 2℃ can be set	▼	A Press once to lower the set temp by 1℃ — High / Low
		B Press twice to lower the set temp by 2 ℃ — High / Low
Slightly cooler A rise up to 2℃ can be set	▲	A Press once to raise the set temp by 1 ℃ — High / Low
		B Press twice to raise the set temp by 2℃ . — High / Low
Uncomfortable because of unsuitable air flow volume.	FAN	Indoor fan speed alternates among High, Medium and Low each time this button is pressed.
Uncomfortable because of unsuitable flow direction.	SWING/LOCK	Press it once, the vertical adjustment louver swings to change vertical airflow direction. Press it again, swings stops. For horizontal airflow direction, please refer to the previous page for details.

9. AUTO RESTART button

Pressing this button to start AUTO RESTART function, LCD displays AUTO RESTART symbol. Pressing it again to cancel AUTO RESTART function.

10. SUPER button

Pressing this button at waiting orders to operate unit in super cool or heat mode. Pressing this button while running to go out of primary operation and into super cool or heat mode.

11. LIGHT button (only for E-type floor standing)

Pressing this button to turn on or off the fluorescent light.

Function Introducing

1. BUZZER FUNCTION

Buzzer exports different period of time according to different operation.

Turn on: sound twice, phonate for 100MSEL, stall for 50MSEL, phonate for 100MSEL

Turn off: sound twice, phonate for 250MSEL, stall for 50MSEL, phonate for 50MSEL

Overheating protection: sound times, phonate for 50MSEL, stall for 50MSEL, phonate for 50MSEL, stall for 50MSEL, phonate for 50MSEL, stall for 50MSEL, phonate for 100MSEL

Common cue symbol: sound once, phonate for 50MSEL

2. VERTICAL VANE CONTROL

Using "SWING/LOCK" button to set various angles of flow or specific angle as you like. Pressing "SWING/LOCK" button once, the vertical adjustment louver will swing up and down automatically. Pressing the "SWING/LOCK" button again when the louvers swing to a suitable angle as desired.

3. INDOOR FAN MOTOR CONTROL

Indoor fan motor elicited wiring rev depends on relay. It has 3 speeds.

4. ELECTRICAL HEATING FUNCTION (only for heat pump type)

Electrical heating starts automatically according to the following conditions when A/C operates in heating mode. If inlet air temperature of indoor unit is below 20℃, the temperature difference between inlet and outlet of indoor unit is more than 2.5℃, compressor operates for 3 minutes, indoor fan motor operates normally and indoor pipe temperature is below 48℃. If it falls short of these conditions, system pauses electrical heating. If it accords with conditions again after pause, A/C requires 5 seconds delay for starting electrical heater. If electrical heater pauses because indoor pipe temperature is more than 48℃, it starts again only while indoor pipe is below 43℃. Cold wind prevention is canceled automatically after electrical heater start.

5. DEFROST FUNCTION

During HEATING operation, when outdoor pipe temperature falls to **–8℃** and compressor operates for 50 minutes, defrosting starts, outdoor fan motor & compressor stop, indoor fan motor operates in preventing cold air mode. 4-valve turns off after 59 seconds, compressor starts to defrost after stalling for over 1 minute.

When outdoor pipe temperature rises to 12℃, defrosting rescinds automatically, compressor stalls. 4-valve starts after 59 seconds, compressor and outdoor fan motor start after stalling for over 1 minute, indoor fan motor operates in preventing cold air mode, the system operates at HEATING mode. Next defrosting starts after compressor operates for 50 minutes in HEATING mode. Every defrosting time doesn't exceed 10 minutes. If defrosting time exceeds 10 minutes, system rescinds defrosting forcibly and operates at HEATING mode. Button is ineffective besides ON/OFF button during defrosting.

6. SLEEP FUNCTION

Pressing SLEEP button of remote controller in any mode, buzzer sounds once after controller receive and system is turned into SLEEP function, indoor fan motor speed translates tiny speed, LCD displays SLEEP symbol.

If air inlet temperature of indoor unit is equal to or more than 26℃ in cooling mode, setting temperature is invariable, otherwise setting temperature rises 0.5℃ per 1 hour within 2 hours. The total setting temperature rise is 1℃, airflow direction according to primary setting mode, but it can be adjusted, operation mode is invariable. A/C turn off automatically after setting SLEEP function 8 hours later.

7. PROTECTION FUNCTION

7.1 3-minutes delay for compressor:

In all modes, compressor doesn't respond temperature changed until it operate for 3 minutes, compressor can restart after it stall for 3 minutes.

7.2 OVERCOOL PROTECTION

If indoor pipe temperature is below-3℃ for continuous 3 minutes in cool and dry modes, compressor and outdoor fan motor stall, LCD displays protection code E1. If indoor pipe temperature is over 5℃, the system retreats from overcool protection and operates normally.

7.3 OVERHEAT PROTECTION(only for heat pump type)

If indoor pipe temperature is over 53℃ in heat mode, outdoor fan motor stalls. If indoor pipe temperature is below 48℃, the system retreats from overheat protection and operates normally. If indoor pipe temperature is over 63℃ when A/C operates for 1 minutes in heat mode, buzzer sounds 4 times, LCD displays protection code E2

7.4 PRESSURE PROTECTION

When the system pressure is too high , the compressor and outdoor fan stalls ,LED displays blooey code “E3”. The A/C can’t operate until the system pressure drops to normal level.

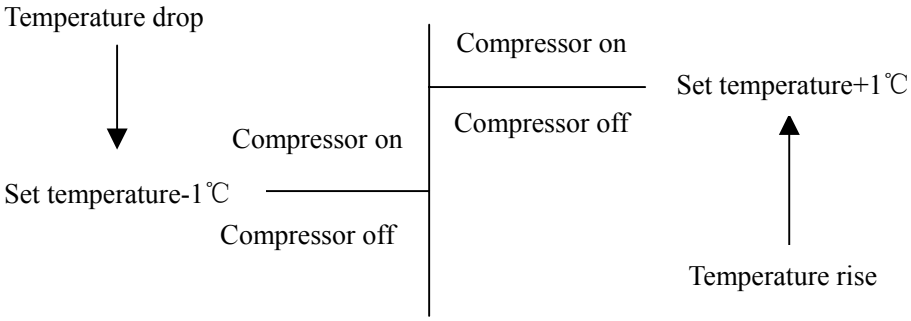
7.5 TROUBLE CODE

LCD displays setting temperature or timing hour when A/C is normal. LCD displays trouble code if protection function appears.

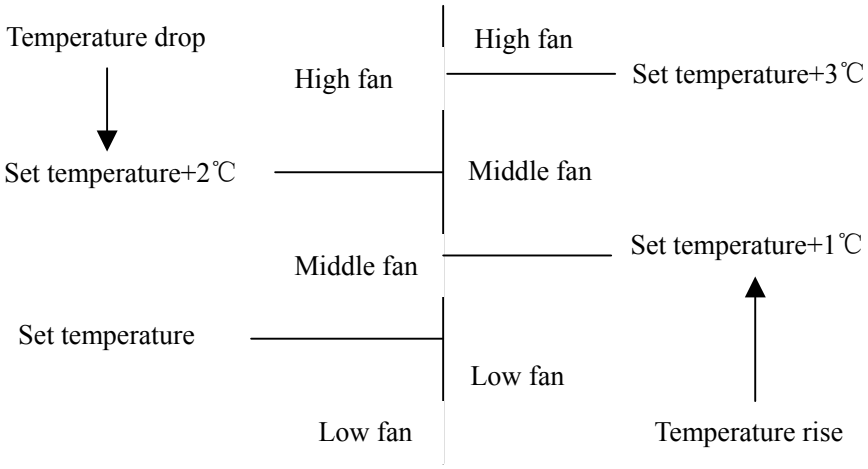
Operation Mode

1. COOLING MODE

When the COOLING mode operation is selected without setting temperature after power supply, the appliance will set the preset temperature at 26℃ automatically. The compressor operates according to the following chart:



In COOLING model, if indoor fan motor speed is set automatism, it operates according to the following chart:



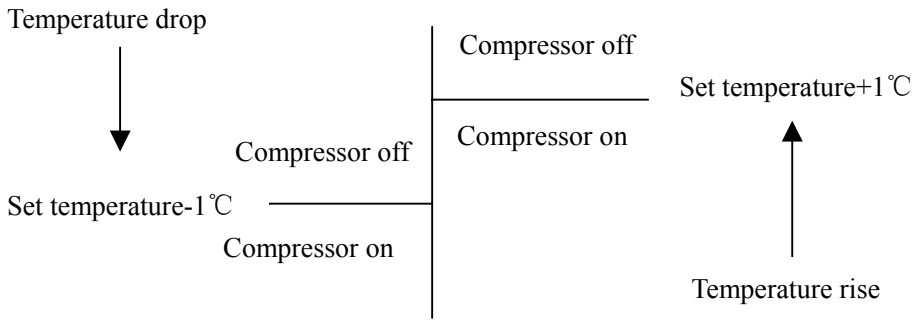
2. DRY MODE

When room temperature is 18℃-32℃, A/C operates in COOLING mode for **3** minutes, then it will sense the intake air temperature and minus 1.5℃ as the setting temperature, indoor motor speed is **TINY,** compressor and outdoor fan motor operates in COOLING mode. The setup for fan motor speed is not viable at this time, but airflow direction can be adjusted, setting temperature can be adjusted ±1℃. Overcool protection is effective.

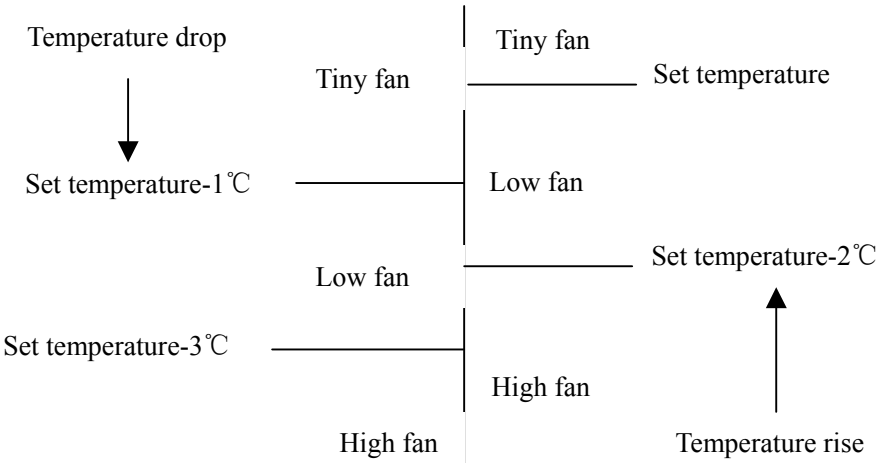
3. HEATING MODE

When A/C operates in heating mode, setting temperature, indoor fan motor speed and airflow direction can be adjusted, preventing cold air function starts. If indoor pipe temperature is below 30℃, indoor fan motor speed switches to tiny automatically, if indoor pipe temperature is below 23℃, indoor fan motor stalls, if indoor temperature is over 35℃, indoor fan motor operates normally. During heating operation, overheating protection starts. If indoor pipe temperature is over 53℃, outdoor fan motor stalls. If indoor pipe temperature is below 48℃, the system retreats from overheating protection and operates normally. If indoor pipe temperature is over 63℃ when A/C operates for 1 minutes in heat mode, buzzer sounds 4 times and A/C stalls.

Compressor starts and stalls as the following chart:



In HEATING model, if indoor fan motor speed is set automatism, it operates according to the following chart:

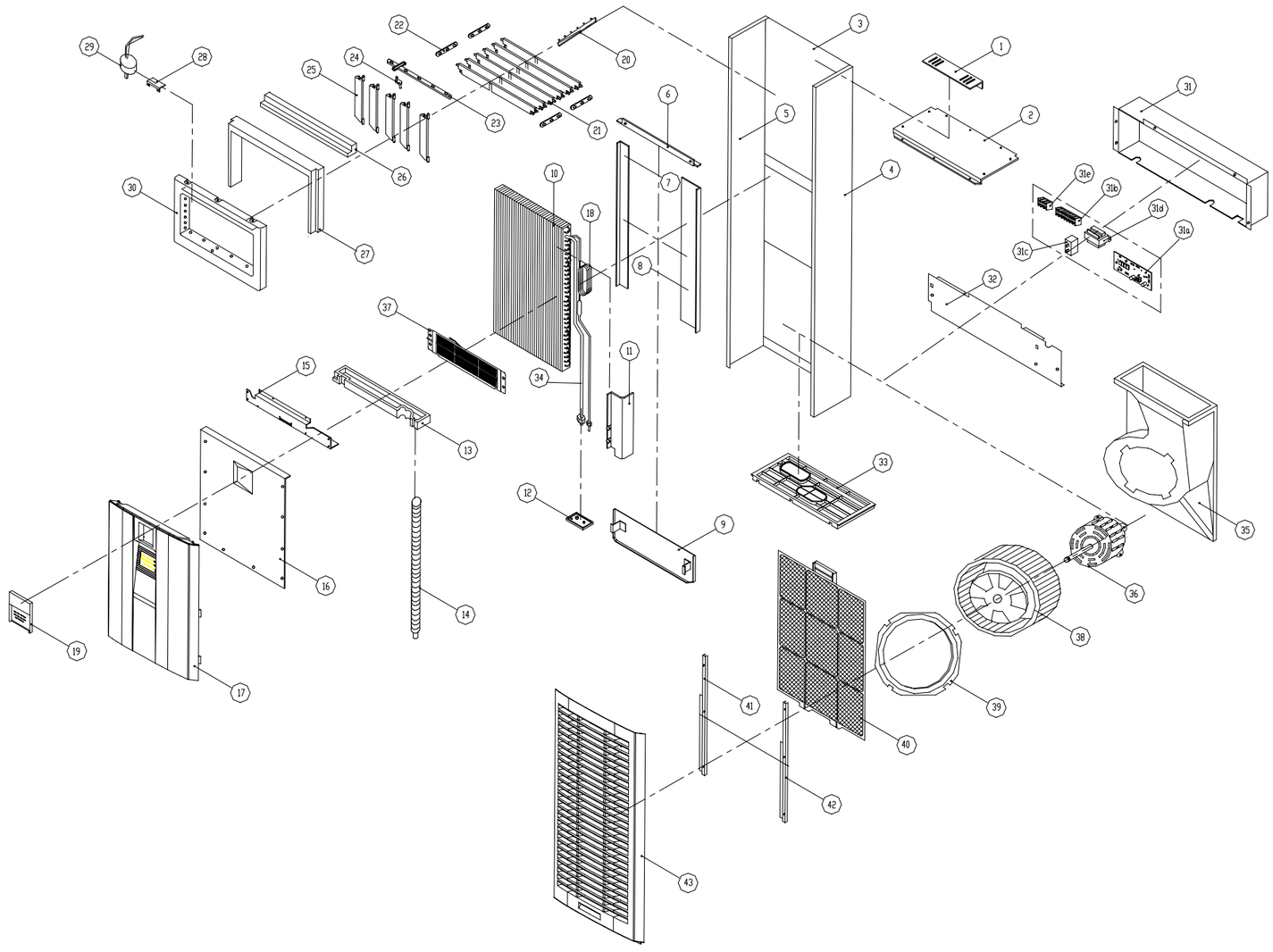


4. FAN MODE

Indoor fan motor operates according to setting mode, airflow direction can be adjusted, compressor and outdoor fan motor stall.

EXPLODED VIEW AND PART LIST

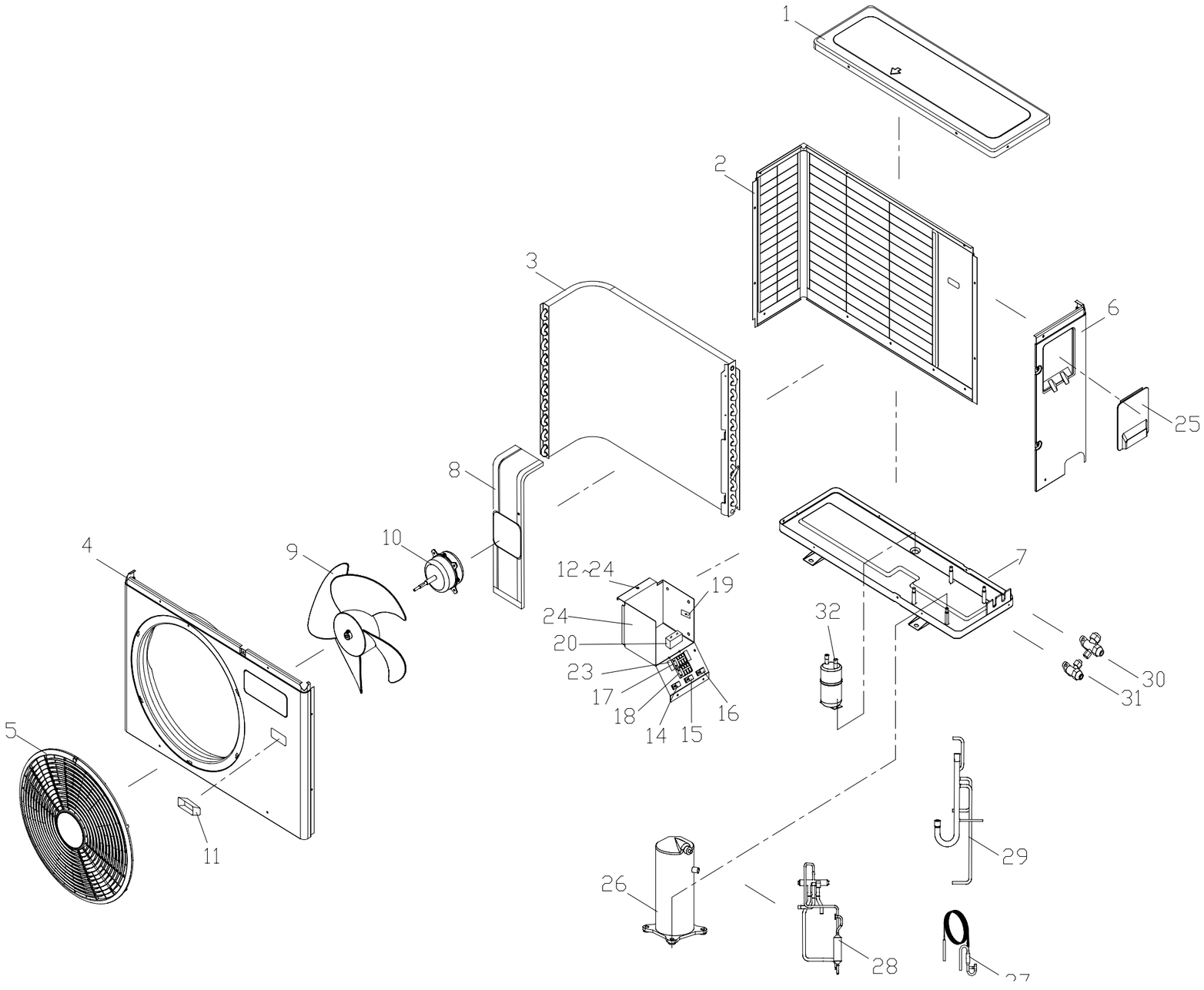
INDOOR UNIT



INDOOR UNIT

No.	Description	Part No.	Qty
1	Upper installation shelf	12033011	1
2	Topmost cover	1105395	1
3	Rear cover	11063008	1
4	Right side cover	8100310	1
5	Left side cover	810039	1
6	Evaporator topmost installation plate	12033017	1
7	Evaporator left installation plate	12033031	1
8	Evaporator right installation plate	12033032	1
9	Evaporator support	1102223	1
10	Evaporator	1301391	1
11	Evaporator baffle	10083002	1
12	Containing water rubber bowl	21063002	1
13	condensate plate assembly	2106103	1
14	Drain hose	210995	1
15	Middle support	100851	1
16	Adiabatic board	16053005	1
17	Front panel	1006545	1
18	Capillary assembly	8130383	1
19	Controller assembly	8140140	1
20	Mid pitman	12013019	1
21	Horizontal vane	1201378	6
22	Side pitman	12013018	4
23	Transverse pitman	12013022	1
24	rocker	12013006	1
25	Vertical vane	12013020	5
26	Air outlet bottom foam	1107552	1
27	Air outlet side foam	1107551	1
28	Synchronous motor retainer	11023011	1
29	Synchronous motor A	14023037	1
30	Air outlet	1201377	1
31	Electrical box	10053004	1
31a	Pc board	1409521	1
31b	Terminal 7PU	150290	1
31c	Fan motor capacitor	14113058	1
31d	Transformer	140561	1
31e	Terminal 3PUB	1502100	1
32	Electrical box cover	11053001	1
33	Base	1002162	1
34	Evaporator deferent pipe	8130393	1
35	Volute	1007132	1
36	Fan motor	1402280	1
37	Electrical heater assembly	814047	1
38	Centrifugal fan	14023032	1
39	Air inpour annulus	24093009	1
40	Air filter	12043006	1
41	Filter left retainer	11023012	1
42	Filter right retainer	11023013	1
43	Nether panel	1006547	1

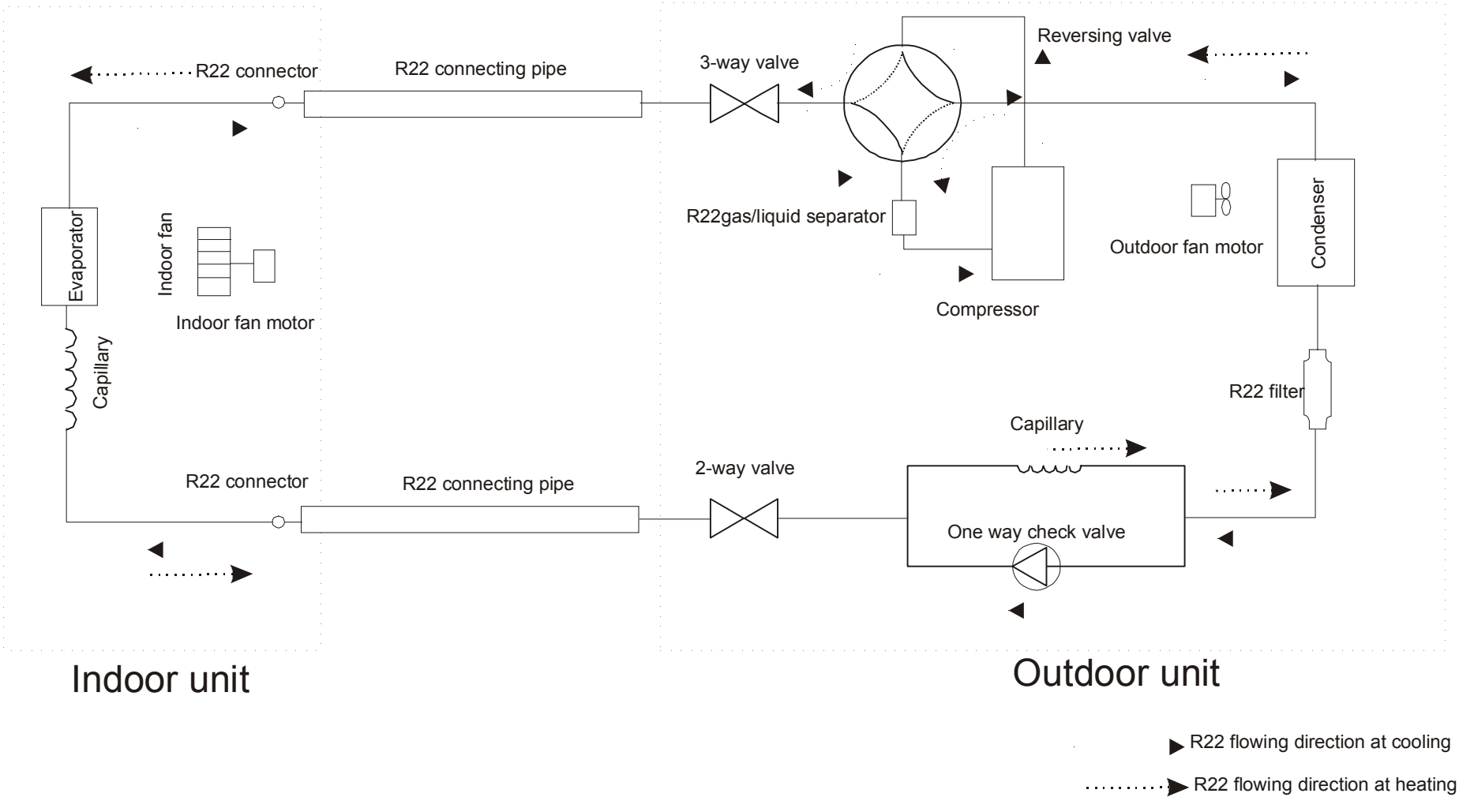
OUTDOOR UNIT



OUTDOOR UNIT

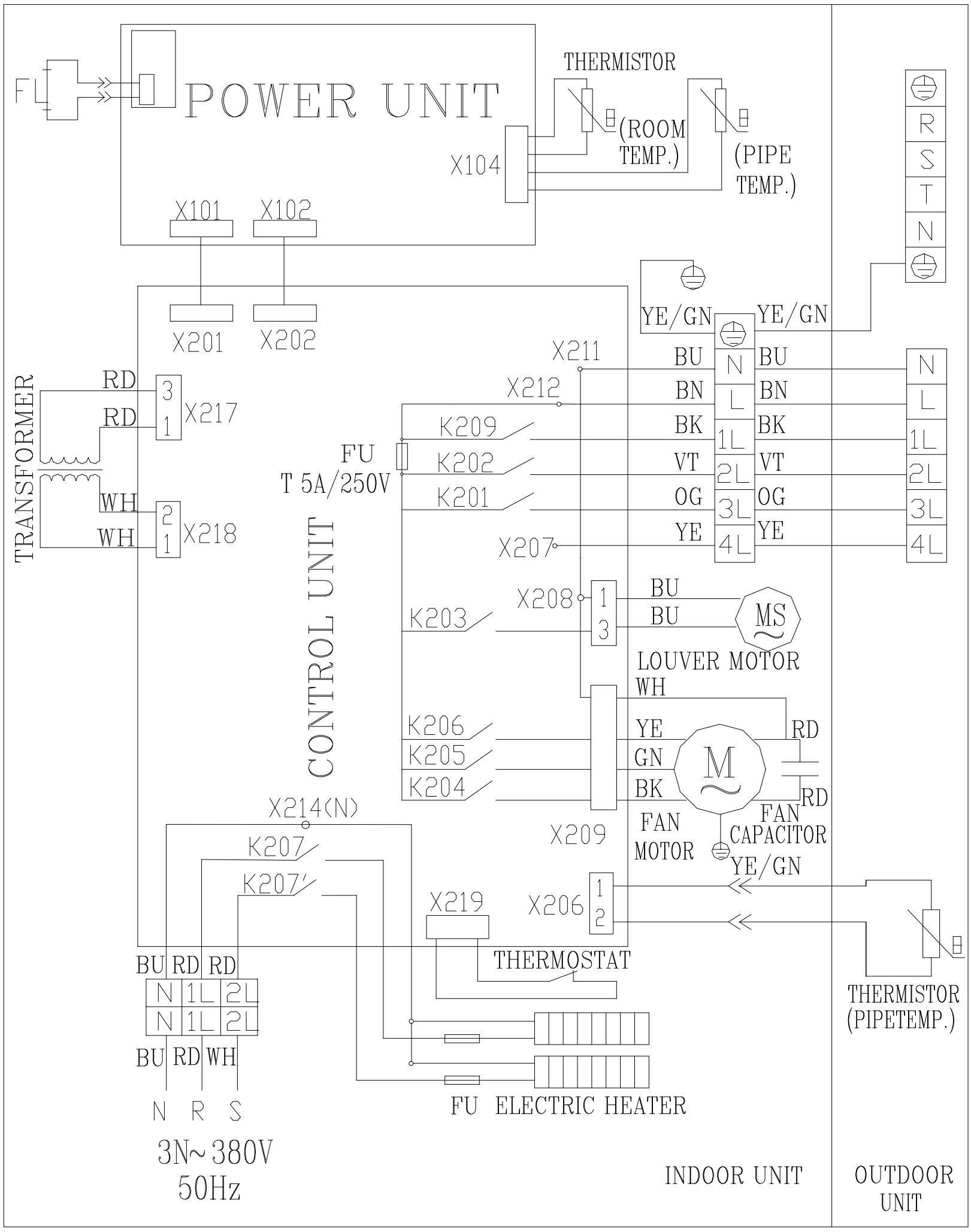
No.	Description	Part No.	Qty
1	Upper cover	21093056	1
2	Rear cover	21093059	1
3	Condenser	8130261	1
4	Front cover	21093062	1
5	Fan guard	21093069	1
6	Right side cover	21093058	1
7	Base	8100228	1
8	Motor support	11093021	1
9	Propeller fan	14023031	1
10	Fan motor	814025	1
11	Gripe	21093063	1
12	Electrical assembly	81401131	1
13	Phase sequence board	14093015	1
14	Clamp	12033012	1
15	Clamp	1203397	1
16	Clamp	1203400	1
17	Terminal 6P1	150257(A)	1
18	Terminal 6P5	150292	1
19	Terminal 2U	150217	1
20	Fan motor capacitor	14113057	1
21	AC contactor	1411865	1
22	Compressor power supplying wiring	8150121	1
23	Wire fixer	11093016	1
24	Electrical box	821023	1
25	Terminal cover	21093063	1
26	Compressor (Dalian Sanyo)	1304320	1
27	Capillary assembly	81303471	1
28	4- valve assembly	8130938	1
29	Diffluent pipe assembly	81303106	1
30	3-way valve 19a	8130923	1
31	2-way valve 10	8130918	1
32	Reserving liquid jar	813054	1

REFRIGERATION DIAGRAM

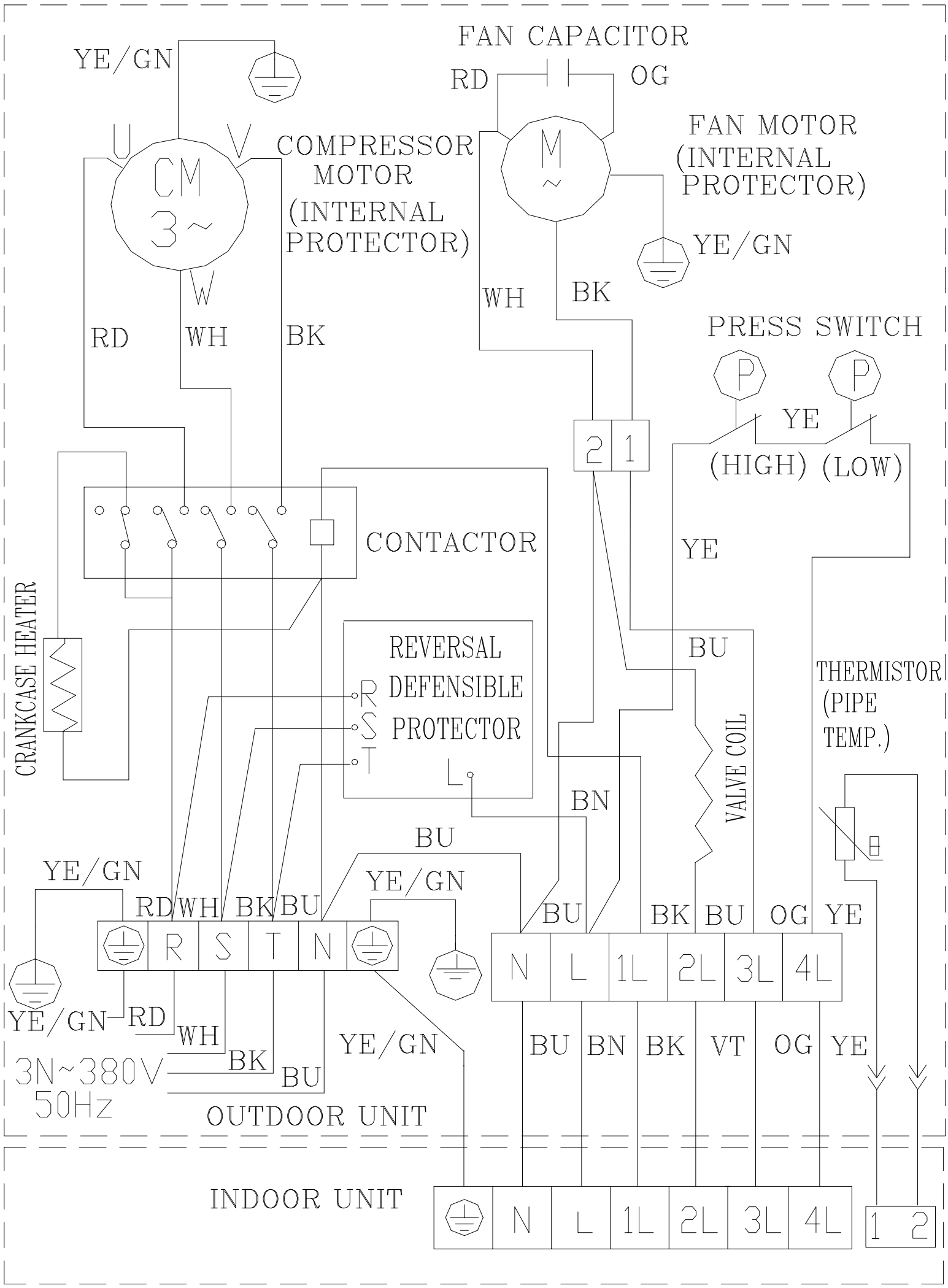


WIRING DIAGRAM

Indoor Unit



Outdoor Unit



AKIRA
makes life better